CAASPP Math Practice Worksheet

20 Key Problems — Most Missed by Korean Students

Grades 7–8 | Algebra · Geometry · Statistics · Number Sense

Name: _____ Date: _____

Period: _____ Score: _____ / 20

DIRECTIONS: Each question has 3 steps. Circle the correct answer (A, B, C, or D) for each step. Show your work in the space provided.

[HARD] = Challenging [MED] = Medium difficulty ★ = Most commonly missed

Q01 Linear Equations [HARD]

CONCEPT:	A linear equation ax + b = c is solved by isolating the variable using inverse operations.
EXAMPLE:	Q: Solve: 3x - 7 = 14 A: Add 7: 3x = 21, divide by 3: x = 7

Step 1: Solve for x: 2x + 5 = 17

A) x = 4 B) x = 6

C) x = 11 D) x = 7

Work Space:

Step 2: Solve for x: 4x - 3 = 13

A) x = 2.5 B) x = 4

C) x = 5 D) x = 3

Work Space:

Step 3: Solve for x: 5x + 2 = 3x + 14

A) x = 4 B) x = 6

C) x = 8 D) x = 3

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q02 Slope & Linear Functions [HARD]

CONCEPT:	Slope m = (y2 - y1)/(x2 - x1). Slope-intercept form: y = mx + b.
EXAMPLE:	Q: Slope through (1,3) and (4,9) A: m = (9-3)/(4-1) = 6/3 = 2

Step 1: Slope through (2, 4) and (6, 12)?

A) m = 1
B) m = 2
C) m = 3
D) m = 4

Work Space:

Step 2: Which equation has slope -3 and y-intercept 5?

A) y = 3x - 5
B) y = 5x - 3
C) y = -3x + 5
D) y = -5x + 3

Work Space:

Step 3: y = 4x - 7. What is the y-intercept?

A) 4
B) -7
C) 7
D) -4

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q03 Systems of Equations [HARD]

CONCEPT:	Solve a system by substitution or elimination to find x and y satisfying both equations.
EXAMPLE:	Q: Solve: x + y = 5, x - y = 1 A: Add: 2x = 6, x = 3, y = 2

Step 1: Solve: x + y = 8 and x - y = 2

A) (5, 3)
B) (3, 5)
C) (6, 2)
D) (4, 4)

Work Space:

Step 2: Solve: 2x + y = 10 and x = 3

A) y = 4
B) y = 6
C) y = 3
D) y = 7

Work Space:

Step 3: If 3x + 2y = 12 and x = 2, what is y?

A) y = 2
B) y = 4
C) y = 3
D) y = 6

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q04 Quadratic Equations [HARD]

CONCEPT:	ax^2 + bx + c = 0. Factor or use quadratic formula: x = (-b +/- sqrt(b^2-4ac)) / 2a
EXAMPLE:	Q: Solve: x^2 - 5x + 6 = 0 A: Factor: (x-2)(x-3) = 0, x = 2 or x = 3

Step 1: Solve: x^2 - 7x + 10 = 0

A) x = 2 or x = 5
B) x = 1 or x = 10
C) x = 3 or x = 4
D) x = -2 or -5

Work Space:

Step 2: Discriminant of: 2x^2 - 4x + 2 = 0

A) 0
B) 8
C) 16
D) -8

Work Space:

Step 3: Solve: x^2 + 2x - 8 = 0

A) x = 2 or x = -4
B) x = 4 or x = -2
C) x = -2 or -4
D) x = 1 or x = 8

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q05 Exponents & Radicals [MED]

CONCEPT:	a^m * a^n = a^(m+n), a^m / a^n = a^(m-n), (a^m)^n = a^(mn), a^(1/n) = nth root of a
EXAMPLE:	Q: Simplify x^5 / x^2 A: x^(5-2) = x^3

Step 1: Simplify: (2^3)^2

A) 32 B) 64

C) 16 D) 36

Work Space:

Step 2: What is 27^(1/3)?

A) 3 B) 9

C) sqrt(27) D) 7

Work Space:

Step 3: Simplify: x^8 * x^(-3) / x^2

A) x^3 B) x^7

C) x^5 D) x^9

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q06 Functions & Notation [HARD]

CONCEPT:	f(x) assigns exactly one output per input. Domain = valid inputs, Range = possible outputs.
EXAMPLE:	Q: If f(x) = 3x^2 - 1, find f(2) A: f(2) = 3(4) - 1 = 11

Step 1: If f(x) = 2x + 3, find f(5).

A) 10 B) 13

C) 16 D) 11

Work Space:

Step 2: If g(x) = x^2 - 4x, find g(-2).

A) 12 B) -4

C) 0 D) 8

Work Space:

Step 3: Domain of h(x) = 1 / (x - 3)?

A) All reals

B) All reals except x = 3

C) x > 0

D) x >= 3

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q07 Ratios & Proportions [MED]

CONCEPT:	Proportion: a/b = c/d. Cross-multiply: ad = bc. Unit rate = quantity per 1 unit.
EXAMPLE:	Q: 3 apples cost $1.50, cost of 10? A: Unit rate $0.50 x 10 = $5.00

Step 1: Solve: 4/6 = x/9

A) x = 5

B) x = 6

C) x = 7

D) x = 8

Work Space:

Step 2: 150 miles in 3 hours. Unit rate (mph)?

A) 40 mph

B) 45 mph

C) 50 mph

D) 60 mph

Work Space:

Step 3: If x/5 = 18/15, find x.

A) x = 5

B) x = 6

C) x = 9

D) x = 7

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q08 Percentages [MED]

CONCEPT:	Percent = Part/Whole x 100. Percent Change = (New - Old)/Old x 100%
EXAMPLE:	Q: What is 30% of 80? A: 0.30 x 80 = 24

Step 1: What is 15% of 200?

A) 25 B) 30

C) 35 D) 40

Work Space:

Step 2: Price went from $50 to $65. Percent increase?

A) 25% B) 30%

C) 15% D) 20%

Work Space:

Step 3: $80 shirt, 25% off. Sale price?

A) $55 B) $60

C) $65 D) $70

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q09 Inequalities [HARD]

CONCEPT:	Solve like equations BUT flip the sign when multiplying or dividing by a NEGATIVE number!
EXAMPLE:	Q: Solve: -3x + 6 > 0 A: -3x > -6 => x < 2 (flip!)

Step 1: Solve: 2x - 4 > 8

A) x > 4 B) x > 6

C) x < 6 D) x > 2

Work Space:

Step 2: Solve: -3x <= 12

A) x <= -4 B) x >= -4

C) x >= 4 D) x <= 4

Work Space:

Step 3: Solution to 4x + 1 < 17?

A) x = 5

B) x = 4

C) x = 3

D) x = 6

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q10 Area & Perimeter [MED]

CONCEPT:	Rectangle A=lw, Triangle A=(1/2)bh, Circle A=pi*r^2, Circumference C=2*pi*r
EXAMPLE:	Q: Area of triangle: base 8, height 5 A: A = 1/2 x 8 x 5 = 20 sq. units

Step 1: Area of circle, r = 7? (pi = 3.14)

A) 43.96

B) 153.86

C) 87.92

D) 49

Work Space:

Step 2: Rectangle: l=12cm, w=5cm. Perimeter?

A) 34 cm

B) 60 cm

C) 17 cm

D) 24 cm

Work Space:

Step 3: Trapezoid: b1=6, b2=10, h=4. Area = (b1+b2)/2 * h

A) 32

B) 64

C) 48

D) 40

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q11 Pythagorean Theorem [MED]

CONCEPT:	For right triangle with legs a, b and hypotenuse c: a^2 + b^2 = c^2
EXAMPLE:	Q: Legs 3 and 4, find hypotenuse. A: 9 + 16 = 25, c = 5

Step 1: Legs 6 and 8. Find hypotenuse.

A) 10 B) 12

C) 14 D) sqrt(28)

Work Space:

Step 2: Hypotenuse 13, one leg 5. Other leg?

A) 8 B) 10

C) 12 D) 11

Work Space:

Step 3: Is 5, 12, 13 a right triangle?

A) Yes: 25+144=169 B) No: 5+12 is not 13

C) Yes, sides different D) No, obtuse

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q12 Volume & Surface Area [HARD]

CONCEPT:	Prism: V=lwh Cylinder: V=pi*r^2*h Cone: V=(1/3)*pi*r^2*h Sphere: V=(4/3)*pi*r^3
EXAMPLE:	Q: Volume of cylinder: r=3, h=5 A: V = pi x 9 x 5 = 45pi ≈ 141.3

Step 1: Volume of prism: l=4, w=3, h=5?

A) 50 B) 60

C) 48 D) 70

Work Space:

Step 2: Cone: r=3, h=7. Volume? (pi=3.14)

A) 65.94 B) 197.82

C) 43.96 D) 131.88

Work Space:

Step 3: Sphere: r=6. Volume? (pi=3.14)

A) 678.24
B) 904.32
C) 452.16
D) 113.04

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q13 Mean, Median, Mode [MED]

CONCEPT:	Mean = sum/n. Median = middle value (sorted). Mode = most frequent value.
EXAMPLE:	Q: Data: 2, 4, 4, 6, 8. Mean/Median/Mode? A: Mean=4.8, Median=4, Mode=4

Step 1: Mean of: {10, 14, 18, 12, 16}

A) 12
B) 14
C) 15
D) 13

Work Space:

Step 2: Median of: {3, 7, 1, 9, 5}

A) 5
B) 7
C) 4
D) 6

Work Space:

Step 3: Mode of: {4, 8, 6, 8, 4, 8, 2}

A) 4
B) 6
C) 8
D) 2

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q14 Probability [HARD]

CONCEPT:	P(A) = favorable outcomes / total outcomes. Independent: P(A and B) = P(A) x P(B).
EXAMPLE:	Q: Bag: 3 red, 7 total. P(red)? A: 3/10 = 0.3

Step 1: Die rolled. P(rolling a 4)?

A) 1/4 B) 1/6

C) 1/3 D) 2/6

Work Space:

Step 2: Bag: 4 red, 6 blue. P(blue)?

A) 0.4 B) 0.6

C) 0.5 D) 0.25

Work Space:

Step 3: Two coins flipped. P(both heads)?

A) 1/2 B) 1/3

C) 1/4 D) 3/4

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q15 Box Plots & IQR [HARD]

CONCEPT:	Five-number summary: Min, Q1, Median, Q3, Max. IQR = Q3 - Q1. Outlier: < Q1-1.5*IQR or > Q3+1.5*IQR
EXAMPLE:	Q: Q1=20, Q3=40. IQR? A: IQR = 40 - 20 = 20

Step 1: Box plot: Q1=15, Q3=35. IQR?

A) 20 B) 25

C) 30 D) 40

Work Space:

Step 2: % of data between Q1 and Q3?

A) 25% B) 50%

C) 75% D) 100%

Work Space:

Step 3: Q1=10, Q3=30. Value of 65 is ___

A) Median
B) Outlier
C) Maximum
D) In Q3

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q16 Scatter Plots [HARD]

CONCEPT:	Positive correlation: both increase. Negative correlation: one increases, other decreases. Line of best fit summarizes trend.
EXAMPLE:	Q: Hours studied vs test score — correlation? A: Positive correlation

Step 1: Temperature up, ice cream sales up. Correlation?

A) Negative
B) None
C) Positive
D) Circular

Work Space:

Step 2: Best fit: y = 2x + 5. Predict y when x = 8.

A) 18
B) 21
C) 24
D) 16

Work Space:

Step 3: Correlation r = -0.92 means:

A) Weak positive
B) Strong positive
C) Strong negative
D) No relationship

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q17 Polynomials [HARD]

CONCEPT:	FOIL: (a+b)(c+d) = ac + ad + bc + bd. (x+a)^2 = x^2 + 2ax + a^2
EXAMPLE:	Q: Expand (x+3)(x-2) A: x^2 - 2x + 3x - 6 = x^2 + x - 6

Step 1: Expand (x+4)(x+2)

A) x^2+6x+6
B) x^2+6x+8
C) x^2+8x+6
D) x^2+4x+8

Work Space:

Step 2: (3x^2+2x-1) + (x^2-4x+5)

A) 4x^2-2x+4
B) 4x^2+2x+4
C) 2x^2-2x+4
D) 4x^2-2x-4

Work Space:

Step 3: Expand (x-5)^2

A) x^2-25
B) x^2+25
C) x^2-10x+25
D) x^2-5x+25

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q18 Rational Expressions [HARD]

CONCEPT:	Simplify by factoring numerator and denominator, then cancel common factors. Check for values that make denominator 0.
EXAMPLE:	Q: Simplify (x^2 - 9)/(x + 3) A: (x-3)(x+3)/(x+3) = x-3

Step 1: Simplify: (x^2 - 25)/(x + 5)

A) x - 5
B) x + 5
C) x^2 - 5
D) 5 - x

Work Space:

Step 2: Value making 3/(x-4) undefined?

A) x=3
B) x=0
C) x=4
D) x=-4

Work Space:

Step 3: Simplify: 4x^2 / 8x

A) x/2
B) 2x
C) 1/(2x)
D) 4x

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q19 Transformations [MED]

CONCEPT:	Translation=shift, Reflection=flip, Rotation=turn, Dilation=scale. Rigid transformations preserve size.
EXAMPLE:	Q: (3,-2) reflected over x-axis? A: (3, 2) — negate y-coordinate

Step 1: (4,-3) reflected over y-axis?

A) (-4,-3)
B) (4,3)
C) (-4,3)
D) (3,-4)

Work Space:

Step 2: Dilation factor 3, area=8. New area?

A) 24
B) 72
C) 27
D) 48

Work Space:

Step 3: Which transformation changes SIZE?

A) Rotation
B) Reflection
C) Translation
D) Dilation

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

Q20 Scientific Notation [MED]

CONCEPT:	Scientific notation: a x 10^n where 1 <= |a| < 10. Multiply: multiply a values, add exponents.
EXAMPLE:	Q: Convert 0.00047 to scientific notation. A: 4.7 x 10^(-4)

Step 1: 63,000 in scientific notation?

A) 63x10^3

B) 6.3x10^4

C) 6.3x10^3

D) 0.63x10^5

Work Space:

Step 2: (3x10^4)(2x10^3) = ?

A) 6x10^7

B) 6x10^12

C) 5x10^7

D) 6x10^(-7)

Work Space:

Step 3: 5.2 x 10^(-3) equals?

A) 5200

B) 0.0052

C) 0.052

D) 52000

Work Space:

Answers: Step 1: ____ | Step 2: ____ | Step 3: ____

ANSWER KEY

Q#	Topic	Step 1	Step 2	Step 3
Q1	Linear Equations	B	B	B
Q2	Slope & Linear Functions	B	C	B
Q3	Systems of Equations	A	A	C
Q4	Quadratic Equations	A	A	A
Q5	Exponents & Radicals	B	A	A
Q6	Functions & Notation	B	A	B
Q7	Ratios & Proportions	B	C	B
Q8	Percentages	B	B	B
Q9	Inequalities	B	B	C
Q10	Area & Perimeter	B	A	A
Q11	Pythagorean Theorem	A	C	A
Q12	Volume & Surface Area	B	A	B
Q13	Mean, Median, Mode	B	A	C
Q14	Probability	B	B	C
Q15	Box Plots & IQR	A	B	B
Q16	Scatter Plots	C	B	C
Q17	Polynomials	B	A	C
Q18	Rational Expressions	A	C	A
Q19	Transformations	A	B	D
Q20	Scientific Notation	B	A	B